## **CLAIMS**

- 1. A self locking apparatus comprising:
- a housing;
- a load initiating element located within the housing;
- a spring located adjacent to the load initiating element, and configured to expand in compression against the housing; and

wherein the load initiating element and spring are slideable within the housing until the spring is loaded into a self locking mode.

- 2. The self locking apparatus of claim 1, wherein the housing is an outer tube.
- 3. The self locking apparatus of claim 2, wherein an inner tube is slideably positioned within the outer tube and is configured to be able to provide a compression force to the spring from a side opposite of the load initiating element.
  - 4. The self locking apparatus of claim 3 further comprising:
  - a pin rigidly attached to the inner tube and slideably attached to the spring;
  - a piston slideably attached to the pin; and

wherein the piston is configured to position the load initiating element, spring and inner tube within the outer tube without loading the spring into a self locking mode.

- 5. The self locking apparatus of claim 3 further comprising:
- a pin rigidly attached to the inner tube and slideably attached to the spring;
- a mass element slideably attached to the pin and configured to provide sufficient inertial load in response to the inner tube being accelerated beyond a design threshold to load the spring into a self locking mode.

- 6. The self locking apparatus of claim 3 further comprising:
- a pin rigidly attached to the inner tube and slideably attached to the spring;
- a cylinder rigidly attached to the pin;
- a second spring in operable communication between the cylinder and a rod; and

wherein the rod is configured to position the cylinder, second spring, load initiating element, spring and inner tube within the outer tube without loading the spring into a self locking mode.

- 7. The self locking apparatus of claim 1, wherein the spring is a wave spring.
- 8. The self locking apparatus of claim 1, wherein the spring is a conic spring.
- 9. The self locking apparatus of claim 8, wherein the conic spring is outwardly biased.
  - 10. The self locking apparatus of claim 1, wherein the spring comprises: an initiator spring; and a plurality of additional springs.
- 11. The self locking apparatus of claim 10, wherein the plurality of additional springs comprise:
  - at least one intermediate load conic spring; and at least one primary load conic spring.
- 12. The self locking apparatus of claim 3, wherein the inner tube is in operable communication with a motor vehicle bumper, and the outer tube is in operable communication with a motor vehicle body.

13. A self locking apparatus comprising:

an outer tube;

an inner tube located within the outer tube;

a load initiating element located within the outer tube and around a portion of the inner tube:

a spring located adjacent to the load initiating element and around a portion of the inner tube and configured to expand in compression against the inner tube; and

the load initiating element, spring and outer tube are slideable about the inner tube until the spring is loaded into a self locking mode.

- 14. The self locking apparatus of claim 13, wherein the outer tube is in operable communication with a motor vehicle bumper, and the inner tube is in operable communication with a motor vehicle body.
  - 15. A self locking apparatus comprising:

an outer tube;

a cylindrical body, with a plurality of slotted surfaces forming a plurality of load transfer segments, and with a bottom annulus, the cylindrical body located within the outer tube;

a spring located adjacent to the bottom annulus and configured to expand in compression against the load transfer segments; and

the slotted cylindrical body and spring are slideable within the outer tube in the absence of the spring being loaded into a self locking mode.

- 16. The self locking apparatus of claim 15, wherein the outer tube is in operable communication with a motor vehicle body, and an inner tube, the inner tube configured to provide a compressive force to the spring, is in operable communication with a motor vehicle bumper.
- 17. The self locking apparatus of claim 15, wherein the annular surface is in the interior of the cylindrical body.

- 18. The self locking apparatus of claim 15, wherein the conic spring is outwardly biased.
  - 19. A self locking apparatus comprising:

an inner tube;

a cylindrical body, with a plurality of slotted surfaces forming a plurality of load transfer segments, and with a bottom annulus, the cylindrical body located adjacent to an inner tube;

a spring located adjacent to the bottom annulus and configured to expand in compression against the load transfer segments; and

the inner tube is slideable with respect to the slotted cylindrical body and spring in the absence of the spring being loaded into a self locking mode.

20. The self locking apparatus of claim 19 further comprising:

an inner tube configured to receive the force provided by the load transfer segments, and the inner tube in operable communication with a motor vehicle body; and

wherein the outer tube is in operable communication with a motor vehicle bumper.

- 21. The self locking apparatus of claim 19, wherein the annular surface is on the exterior of the cylindrical body.
- 22. The self locking apparatus of claim 19, wherein the conic spring is inwardly biased.